HEALTH CONSULTATION

SENTINEL SURVEILLANCE SYSTEM PROJECT

GRANTSVILLE, TOOELE COUNTY, UTAH

AUGUST 24, 1999

Prepared by:

Utah Department of Health
Bureau of Epidemiology
Environmental Epidemiology Program
Under Cooperative Agreement with the
Agency for Toxic Substances and Disease Registry

Sentinel Surveillance System for Grantsville, Utah

BACKGROUND AND STATEMENT OF ISSUES

The purpose of this health consultation is to examine the incidence of cancer, asthma, multiple sclerosis, and birth defects in Grantsville, Utah, and to determine whether these diseases are increasing and whether further epidemiological studies are warranted (e.g., case-control).

Grantsville is a rural community of approximately six thousand individuals representing approximately 0.25% of the Utah population. In 1994, some of the citizens expressed concern that their community was experiencing more adverse health effects than the general population because of environmental pollution related to industrial and military operations in Tooele County. Myron Bateman, Health Officer of the Tooele County Health Department, requested assistance from the Environmental Epidemiology Program (EEP), Utah Department of Health, in conducting an investigation to determine if the incidence of cancer was increasing at a greater frequency in Grantsville compared to the state of Utah.

The results of that investigation (completed in 1995) indicated that the rates (per 100,000 person years) of several cancers were increasing in Grantsville between 1973 and 1993. Those cancers included prostate, colorectal, breast, cervical, and lung/bronchial cancer. However, only the number of cervical cancer cases were found to be statistically significantly greater than expected in Grantsville during the time period of 1988-1993 compared to the state of Utah during the same time period. Brain/nervous system cancer was found to be statistically significantly increased over the entire 1973 through 1993 study period. The possibility of an association of increased cancer rates to environmental pollution in Grantsville could not be determined. The primary risk factors for those cancers identified as increasing in Grantsville are familial or behavioral in nature.

To further address the ongoing health concerns of Grantsville citizens, the Tooele County Health Department and EEP initiated a sentinel surveillance system for Grantsville for *cancer, asthma, multiple sclerosis, and birth defects* for a two-year period beginning in January 1997 and concluding on December 31, 1998. The protocol for the surveillance project is presented in Appendix A. These diseases were selected because some citizens in Grantsville perceived them as increasing in the community.

This surveillance project was designed to allow the community to report any events relative to cancer, asthma, multiple sclerosis, and birth defects to the Tooele County Health Department. These rates or numbers of cases would then be compared to those of the state of Utah to determine if an increase in disease rates in the Grantsville population had occurred.

This health consultation reports the results of a statistical review of the incidence of cancers (1973-1997), asthma, and multiple sclerosis (1992-1997), and birth defects 1996-1998) in

Grantsville that was conducted at the request of the Tooele County Health Department. The results of the analysis from this surveillance project, along with accepted epidemiological methods, will be used to determine whether disease rates are increased in Grantsville and whether the rates warrant a further epidemiological study (e.g., case-control).

The following list includes the diseases under surveillance in Grantsville:

A. Cancers: 1973 - 1997

prostate	breast	cervix
uterus	lung/bronchial	brain/nervous system
melanoma	stomach	leukemia
colorectal	bladder	kidney
pancreas	ovary	lip
larynx	salivary glands	thyroid gland
melanoma	other	

B. Asthma (1992 - 1997)

C. Multiple Sclerosis (1992 -1997)

D. Birth Defects (1996 - 1998)

(1) Neural Tube Defects

(2) Oral Cleft Defects

(3) Trisomy 13, 18, and 21

DISCUSSION

Cancer data for this investigation were obtained from the Utah Cancer Registry.[1] The Utah Cancer Registry receives reports on each newly diagnosed case of cancer in Utah from hospitals, radiation therapy facilities, pathology laboratories, nursing homes, and physicians. In addition, death certificate data are reviewed for cases that may not have been reported to the registry.

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[1] This research was supported by the Utah Cancer Registry, which is funded by Contract No. NO1-CN-6700 from the National Cancer Institute with additional support from the Utah Department of Health and the University of Utah.

Asthma and multiple sclerosis disease data were derived from hospital discharges reported to the Utah Department of Health. Hospitals are required by Utah Administrative Rule R428 to report information on inpatient care and discharges to the Utah Department of Health. The Office of Health Data Analysis, Utah Department of Health, serves as the collecting agency and repository for the data.

The Utah Birth Defect Network, Utah Department of Health, serves as the registry for birth defect data. However, birth defect data for 1996 through 1998 were insufficient for data analysis.

Statistical Analysis and Outcomes

The criterion for statistical significance as established by this investigation would require a Standard Incidence Ratio equal to or greater than one (1.0), a confidence interval (CI) (Frumkin, et al, 1987) that does not include one (1.0), and statistical power equal to or greater than 70 percent (Beaumont et al, 1981) (Dowdy and Weardin, 1983).

The comparison population consisted of the *crude rates* from Utah's observed number of cases minus zip code 84029's (Grantsville) observed number of cases during the time period 1973 through 1997 for cancer cases and 1992 through 1997 for hospital discharges associated with asthma and multiple sclerosis. Population data were obtained from the Utah State Data Center (USDC, 1998). In the interest of consistency, from this point forward the comparison population of Utah's rates minus zip code 84029 will be referred to as *the state of Utah* and zip code 84029 will be referred to as *Grantsville* in all discussions presented.

Cancers

A cancer cluster is defined as three or more cases occurring within a certain location or geographical area and time period (Aldrich and Griffith, 1993). Statistical analysis of a cancer type was not performed whenever there were fewer than three cases of the same type of cancer found in Grantsville (ATSDR, 1993).

Data obtained from the Utah Cancer Registry was specific to Grantsville and the state of Utah. The data included counts (observed number of cases) for cancers from: 1) all sites (total cancers); 2) each body system; and 3) specific types that have three or more occurrences from 1973 through 1997. The data received was then stratified into the following time periods: 1973-1977 (five years); 1978-1982 (five years); 1983-1987 (five years); 1988-1992 (five years), and 1993-1997 (five years). Cancer incidence data for 1998 were not available. Crude rates were used and are calculated per 100,000 person years. Cancer rates could not be age-adjusted because age-specific population rates were not available for Grantsville during this time period.

The cancer sites that occurred three or more times are as follows:

Colorectal
Kidney and Renal
Thyroid
Uterine Corpus
Blood System
Salivary Glands
Lung
Melanoma
Brain
Prostate
Cervix Uteri
Pancreas
Larynx
Gum and other Mouth
Urinary Bladder
Lymph Node
Breast
Ovary
Lip
Stomach

The results of this investigation identified cervical cancer cases as the only cancer cases that were significantly elevated. Cervical cancer cases were significantly elevated in time period 1988 - 1992, and cumulatively from 1973 through 1997 compared to the state of Utah. No other cancer cases from any site demonstrated significantly elevated rates during any of the time periods analyzed in Grantsville from 1973 through 1997.

Although not significant, breast, colorectal, lung/bronchial, and prostate cancer cases were identified as the most frequently occurring cancers in Grantsville. These cancer cases (and cervical cancer cases) accounted for 54.5 percent of the total cancer cases that occurred in Grantsville from 1973 through 1997. These are among the most common cancers reported in Utah and the United States (Merck Manual, 1992 and UCR, 1996). Appendix A presents risk factors associated with these cancers.

Asthma and Multiple Sclerosis

Asthma and multiple sclerosis disease incidence was derived from hospital discharge data tabulated by year of discharge covering the years 1992 through 1997 for Grantsville and the state of Utah. Hospital discharge data associated with asthma and multiple sclerosis was not available for 1998.

International Classification of Diseases, 9th Revision, diagnostic (ICD-9) codes were used to identify asthma (ICD-9 Code 493) and multiple sclerosis (ICD-9 Code 340). Rates for hospital discharges associated with asthma and multiple sclerosis were calculated per 10,000 person years. Appendix A presents risk factors associated with asthma and multiple sclerosis.

Asthma: Seventy hospitalized cases of Grantsville residents with the specific ICD-9 codes for asthma from 1992 through 1997 were identified. The crude rates for hospitalized cases of asthma in Grantsville are slightly higher than the state of Utah in 1994, 1995, and 1997. These rates are not statistically significant. The highest percentage of cases were children 0 -14 years of age (20 percent) and persons 65 years and older (34 percent), and females accounted for 64

percent of the cases. Conversely, the state of Utah's percentage of hospitalized asthma cases for children 0-14 years of age is 44 percent and for persons 65+ years of age is 15 percent, and females accounted for 56 percent of the cases.

Multiple Sclerosis: From 1992 through 1997, six hospital discharges were associated with multiple sclerosis in Grantsville. The number (crude rate) of hospitalized cases of multiple sclerosis in Grantsville were increased compared to the state of Utah in 1993, 1996, and 1997. However, the number of cases are not statistically significantly increased in any specific year from 1992 through 1997 compared to the state of Utah. Five cases were female and four cases were 30 - 44 years of age.

Birth Defects

No birth defect cases were reported by Grantsville residents. The birth defect data that were available were insufficient to perform any meaningful statistical review. Therefore, the outcome of the analysis was determined as inconclusive.

CHILD HEALTH INITIATIVE

ATSDR's Child Health Initiative recognized that the unique vulnerabilities of infants and children demand special emphasis in communities faced with contamination of their water, soil, air, or food. Children are at a greater risk than adults from certain kinds of exposures to hazardous substances emitted from waste sites and emergency events. They are more likely to be exposed because they play outdoors and they often bring food into contaminated areas. They are more likely to come into contact with dust, soil, and heavy vapors close to the ground. The developing body systems of children can sustain permanent damage if toxic exposures occur during critical growth stages.

No environmental data are available to evaluate whether contamination is present in Grantsville. Therefore, EEP cannot evaluate whether people are being exposed to contamination in this community. EEP did not find any indicators that would suggest children are at a greater risk to develop the diseases of concern.

CONCLUSIONS

EEP found cervical cancer as the only cancer in Grantsville that was significantly increased compared to the state of Utah. None of the other cancers evaluated were significantly elevated in Grantsville over the 25-year study period from 1973 through 1997. No significant increases were observed in the incidence of hospital discharges associated with asthma and multiple sclerosis.

No diseases were reported to the Tooele County Health Department during the surveillance study period. Birth defect data were insufficient to perform a meaningful analysis.

RECOMMENDATIONS

1. Provide increased cervical cancer screening opportunities to Grantsville residents.

2. Increase public awareness of risk factors associated with cervical cancer and the importance of early screening.

Sentinel Surveillance System for Grantsville, Utah

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CERTIFICATION

This Sentinel Surveillance System Health Consultation for Grantsville, Utah (Tooele County), was prepared by the State of Utah Department of Health under a cooperative agreement with the Agency for Toxic Substances and Disease Registry (ATSDR). It is in accordance with approved methodology and procedures existing at the time the health consultation was begun.

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The Division of Health Assessment and Consultation, ATSDR, has reviewed this health consultation and concurs with its findings.

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